

60 Seconds...

A Minute of Technology Updates
 Heraeus Thick Film Materials Division

July 2009 Volume 11, Issue 2

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Symposium Schedule

Heraeus TFD will be represented at the following locations this year. Please make a note on your calendars for these upcoming events:

September 21 - 25, 2009
[24th European Photovoltaic Solar Energy Conference](#) Hamburg, Germany

November 1 - 5, 2009
[IMAPS 2009](#)
 San Jose, California USA

November 16 - 19, 2009
[Fuel Cell Seminar and](#)

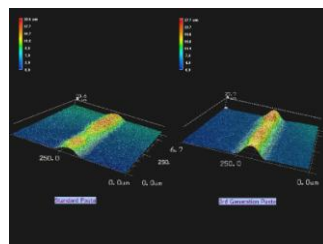
Product Spotlight SOL953 3rd Generation Front Side Silver for Solar Cells



As part of the Heraeus Thick Film Materials PV Division's ever expanding line of silver pastes, SOL953 has been introduced for lightly doped emitters. It is the 3rd

generation front side Ag conductor for mono and multicrystalline silicon solar cell wafers. Optimized for high throughput processing, SOL953 provides excellent aspect ratio and fine line resolution for advanced cell designs. The unique chemistry of SOL953 enhances the etch of SiN_x:H anti-reflective coating, significantly improves contact and preserves the junction quality on high sheet emitters during the spike firing process. SOL953 can be co-fired with commercially available backside Al and Ag pastes. A few key benefits for this paste are:

- High aspect ratio
- Excellent fine line resolution
- Low contact resistance on lightly doped emitter
- Cd free
- Wide process window
- For high sheet emitter



Print Resolution Comparison between SOL953 and Early Generation Paste.

[Exposition](#)

Palm Springs, California
USA

Corporate Name Change for West Conshohocken Site

As of April 1, 2009, the Heraeus businesses in West Conshohocken, Pennsylvania and Chandler, Arizona were transferred to a new wholly owned subsidiary, Heraeus Materials Technology LLC (also known as HMT). This reorganization is merely a change of name. All personnel at each location are the same, only the entity has been changed. This name change should be noted for all future purchase orders and payments, which used to be directed to Heraeus Incorporated.

Spots Filling Quickly for Screen Printing Workshop

For a complete product brochure of SOL953, contact Gail Strong at gail.strong@heraeus.com

<i>Design Finger Line Opening</i>	<i>Screen Recommendation</i>
> 80 µm	325 mesh, 23 µm S.S. wire, 25 µm EOM, 30° wire bias
80 µm - 40 µm	290 mesh, 20 µm S.S. wire, 18-25 µm EOM, 30° wire bias
≤ 40 µm	400 mesh, 18 µm S.S. wire, 5 µm EOM, 22.5° wire bias

<i>Printing Parameters Recommendation</i>	
Squeegee Durometer	70-80
Squeegee Speed	≥ 200 mm/sec
Squeegee Pressure	0.8 Bar (64N) -1.0 Bar (80 N)
Screen Snap-Off	1.2 -1.5 mm (12"X12" screen), vary with screen tension and age

Product Spotlight - Pt Metallizations

With the addition of the BASF line of thick film pastes, Heraeus TFD now is offering an expanded product line of Platinum metallizations. Platinum is useful in applications where a catalytic reaction takes place. For platinum based oxygen sensors, the platinum catalyst creates a chemical reaction, which in turn generates a voltage to send a signal if the oxygen/exhaust mixture is too lean or too rich. There are many other applications where the metallization needs to operate at higher temperatures, as well as to create an inert fired structure in a variety of different atmospheres. In these cases, Platinum is the metallurgy of choice.

Heraeus TFD thick film platinum formulations are most commonly used in the following applications:

- Oxygen sensors (planar and thimble)
- Oxygen generation devices
- Implantable medical devices
- Industrial control sensors
- Solid Oxide fuel cell (SOFC) Current Collectors
- Co-fired internal electrodes for multilayer components, such as PZT actuators

The date has been set for the next Heraeus TFD Thick Film Screen Printing Workshop in West Conshohocken. An additional day now makes it a three day course. In addition to two days of in house lectures and "hands on" screen printing instruction, the workshop also include a "field trip" to Sefar Printing Solutions in Lumberton, New Jersey for a plant tour and an extensive presentation on screen technology. So far a total of 30 Heraeus TFD customers have benefited from the workshop.

The cost of the course is \$300 and includes three nights lodging, most meals and course materials. The participant will provide their own transportation to Heraeus. Please contact Meg Tredinnick by [email](#) or by phone at 610-825-6050 for more information and/or to reserve your spot for the workshop.

Part Number	Application	Description	% Pt
6082	Brushing	Reactive bond	66
6926	Brushing	Unfritted	66
A3788A	Brushing	Reactive bond	60
A4338A	Brushing	Unfritted	65
A6080XR	Screen Printing	Inner Layer conductor	70
C3605P	Spray or Brush	Unfritted	70.2
C3605S	Screen Printing	Unfritted	67.7
C3657	Screen Printing	Fritted	62
CL11-5100	Screen Printing	Oxide bonded	73.5
CL11-5349	Brushing	Oxide Bonded	72
CL11-5871	Screen Printing	Unfritted	73.5
CL11-6109	Screen Printing	Fritted, acid resistant	72
CL11-7171	Screen Printing	Inner layer – matched to alumina	75
CL11-7840	Screen/Stencil printing	Inner layer or to fill large cavities	77.9
CL11-7859	Screen Printing	Internal Electrode	67
CL11-8822	Screen/Stencil printing	Via Fill for alumina	59.5
DC430-79	Screen Printing	Fritted conductor paste	61.2
LPA88-11S	Screen printing	Fritted conductor paste, co-fireable, can be used on tape	71.1
M637C	Screen printing	Internal electrode paste	67

For data sheets or to request pricing for any of these pastes, please contact your local Heraeus TFD representative.

Heraeus TFD Welcomes Virginia Garcia and Matt Sgriccia to the Technology Group

Heraeus TFD is pleased to announce the arrival of two new scientists to the Thick Film Technology group. Having both worked at BASF in East Newark, NJ, both Virginia Garcia and Matt Sgriccia bring a wealth of knowledge and experience to our team.



Prior to Virginia's latest post at Heraeus TFD, she worked in the R & D group of the Electronics and Automotive business of Engelhard (which became BASF) in East Newark, New Jersey. Virginia's

focus was product testing, modification and improvements of BASF products according to customer needs and specifications. Virginia was born and raised in the Philippines and graduated from Far Eastern University in the Philippines with a degree in Chemistry (BS). She migrated here in the US in 1990 to her home state of New Jersey. In Virginia's spare time, she likes to not only watch major tennis tournaments on TV, but play as well. Virginia also enjoys gardening and doing Sudoku. Virginia can be reached at virginia.garcia@heraeus.com.

Matt was born on an Air Force base in Wiesbaden, Germany but was raised in western Pennsylvania. He is a graduate of Penn



Titan Chang - Asia Sales and Technical Service Manager, recently conducted a Thick Film Screen Printing training seminar at Foxconn

Quick Links

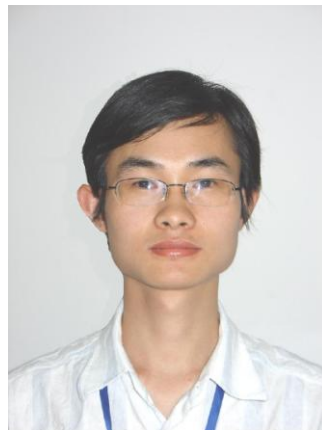
www.heraeus-thickfilm.com

www.pvsilverpaste.com

www.imaps.org

State University with a bachelor's degree in Ceramic Science and Engineering. Prior to joining Heraeus, Matt worked for 17 years as a development engineer responsible for developing glass compositions and enamels used for decorative, appliance, and automotive glass. In Matt's free time, he enjoys all types of sports. With his wife Sharon, they both love to read, travel and explore new restaurants. Matt can be reached at matt.sgriccia@heraeus.com.

Davy Dai - Newest Member of Heraeus Shanghai TF Sales Team



Heraeus Shanghai recently added Mr. Dai "Davy" Wei to their expanding Thick Film Sales Team. Mr. Dai is a graduate of the Donghua University of Science and Technology with a Bachelor's degree in Material Science and Engineering. Upon graduation from university, Davy was employed as an Electronics Development Engineer in Cyntec's Research and Development group in Suzhou, China. While at Cyntec, Davy's work was primarily involved with SMD resistor technology and applications of thick film plasma. We welcome Davy and wish him much success as he focuses on potential thick film hybrid applications in China. Mr. Dai can be reached at davy.dai@heraeus.com.

This newsletter was provided by the Heraeus TFD Technical Service Department. Contributions were received from:

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Any comments about this issue or suggestions for future issues are always welcome. - Editor

Heraeus, the precious metals and technology group headquartered in Hanau, Germany, is a global private company in the business segments of precious metals, dental health, sensors, quartz glass, and specialty lighting sources. With revenues of 12 billion Euro and over 11,000 employees, Heraeus has stood out for more than 150 years as one of the leading companies involved in precious metals and materials technology.